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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/427,457	10/16/1999	GEOFF P. ANDERSEN	AFB00497	3207
7590	03/06/2003		EXAMINER	
THOMAS C STOVER ESC.JAZ 40 WRIGHT STREET HANSCOM AFB, MA 017312903			CHANG, AUDREY Y	
		ART UNIT	PAPER NUMBER	
		2872		
				DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/427,457	ANDERSEN, GEOFF P.
	Examiner	Art Unit
	Audrey Y. Chang	2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 16 December 2002.

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-8, 12-26 and 29-39 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-8, 12-26 and 29-39 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION***Remark***

- This Office Action is in response to applicant's amendment filed on December 16, 2002, which has been entered as paper number 19.
- By this amendment, the applicant has amended claims 1, 12, 18, and 37.
- Claims 1-8, 12-26 and 29-39 remain pending in this application.
- The objection to the drawings set forth in the previous Office Action dated September 9, 2002, still holds.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claim 36 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.**

The specification fails to teach that how could an *additional interference* pattern being formed by illuminating the hologram with the reference beam, as recited in claim 36. The corrected image light of the article is the reconstructed reference light or conjugated reference light bearing the article information, which *will not be able* to interfere with the reference light beam itself to create interference patterns.

3. **Claims 1, 2-8, 12-14, 19, 21-26, 29-31 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably**

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convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on *newly added matters* are set forth in the previous Office Action dated September 9, 2002.

4. **Claims 1, 2-8, 12-14, 19, 21-26 and 29-31 are rejected under 35 U.S.C. 112, first paragraph,** as containing subject matter which was not described in the specification in such a way as to *enable* one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 2, 19 and 21 have been amended, in the previous amendment, to include the phrase “**a holographic image corrector comprising a microscope**”. The specification fails to teach how could a holographic image corrector which is simply a **single** optical plate is capable of comprising a microscope, which is a complicated optical system having more than one optical components. Claims 3-8, 12-14, 22-26, and 29-31 inherit the rejection from their respective based claim. The specification states “the objective optical system ... (which can be employed e.g. as a microscope)”, please see page 5 line 13 of the specification, which means that the “objective optical system” can be employed *AS* a microscope. However the specification **does not teach** that the “*holographic image corrector*” *comprises* a microscope. The specification also does not teach the *objective optical system comprises* a microscope but only supports that the objective optical system may be *employed* as a microscope in the sense that it is **employed in** a microscope. It is clearly known to one skilled in the art that the essential elements of a microscope include objective optical system and eyepiece optical system. An objective optical system therefore will not be able to perform as a microscope by itself and it does not comprise or include a microscope rather it is comprised *within* a microscope. Furthermore, the applicant is respectfully reminded that the *holographic image corrector* is *not* equal to the objective optical system. The

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holographic image corrector is just *a hologram plate* that can be employed within with the objective optical system and can be employed within a microscope with the objective optical system. However it *does not comprise* a microscope. The applicant is respectfully reminded that the holographic image corrector does not include the objective rather it contains the objective *information* as a hologram recorded within a recording medium.

The specification also fails to teach how could the image corrector is capable of “providing an accurate image *in a recording medium*” as recited in claims 18 and 37. The image correction is never meant for providing a correct image in a recording medium rather the recording medium is used to record the distortion of the objective. *The accurate image is simply cannot be provided “in the recording medium”.*

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 8, 12-14, 15-17, 18, 19, 20, 21-26, 29-31, 32-36, 37, 39 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Leith (PN. 3,580,655) in view of the patents issued to Reynolds et al (PN. 4,902,100) and Fusek et al (PN. 4,478,481).

Leith teaches a *method and apparatus* for producing a *holographic phase plate*, serves as the *holographic image corrector*, for *correcting* aberrations and distortions caused by an *optical system*, wherein a collimated *laser light beam* generated by a *coherent light source* (201, Figure 27), serves as the first laser light beam, is send to illuminate the *optical system* (205), to form an *object beam* (215). The

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object beam then *intersects* and *interferes* with a *reference laser beam*, generated from the same coherent light source, in a *photographic plate* (213), serves as the *recording medium*, to record a hologram bearing the object information of the optical system. Leith teaches that after the holographic phase plate is developed, an object (219, Figure 28) intended to be viewed is placed at the object plane of the optical system wherein the light illuminates and reflects off the object will be passed through the optical system and the holographic phase plate to produce a *corrected* image of the object at off-axis position, (223, Figure 28). Leith teaches that the preferred coherent light source is laser light source, (please see column 2, lines 19-20).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the optical system is an objective or is an objective in a microscope. However since the method for correcting the aberrations of the *optical system* of Leith is not restricted to a particular optical system and may be applied to *any* optical system, which certainly include an objective or an objective in a microscope, this feature is therefore implicitly included. (It is noted that the feature concerning "a corrector hologram maker comprises a microscope" and the feature "a holographic image corrector comprises a microscope", they are rejected under 35 USC 112, first paragraph, for reasons stated above.) The features concerning the holographic optical element being used in a microscope are also considered to be obvious modifications to one skilled in the art for it has been held that a recitation with respect to the manner in which a claimed apparatus *is intended to be employed* does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Madham*, 2 USPQ2d 1647 (1987). With regard to the feature concerning the "image correction in microscope" which is stated in the *preamble*, it has been held that a *preamble* is denied the effect of a limitation wherein the claim is drawn to a structure and the portion of the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. *Kropa v. Robie*, 88 USPQ 478 (CCPA 1951). In this case the claims following the preamble each contains a self-

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contained description of the structure for making a hologram using an objective that does not depend on the "microscope" to be complete.

This reference also fails to teach explicitly that a pinhole is mounted in front of the optical system. However it does teach a collimated light beam from the coherent light source or laser light source is used to illuminate the optical system and to produce the reference light beam. It is implicitly true that the light beam generated from a laser light source is not automatically collimated. **Reynolds** in the same field of endeavor demonstrates that a holographic aberration corrector can be recorded using laser light source with a beam expanders placed in front of the optical system (11, Figure 5), and in the path of reference beam to produce desired expanded and collimated light beams for illuminating the optical system and for recording in the recording medium, (please see Figure 5 of Reynolds). It is implicitly true that the beam expander and collimator consists a *pinhole* as demonstrated in the Figure 5 of Reynolds and explicitly demonstrated by the teachings of Fusek, wherein beam expanding and collimating means (54) consists a pinhole mask, (60, Figure 5, column 5, lines 50-55). It would then have been obvious to one skilled in the art to apply the teachings of Reynolds and Fusek to modify the apparatus of Leith to include a pinhole in front of the optical system for the benefit of actually providing and creating *expanded* and *collimated* light beam from the laser light source to illuminate the optical system. Leith teaches to use a non-coherent light source for illuminating the object for viewing but it does not teach explicitly to use the same wavelength of the laser beam to illuminate the object. However the non-coherent light certainly has to include the light having same wavelength as the recording laser light in order to reconstruct the holographic image corrector. Such feature is therefore implicitly included.

With regard to the features concerning the optical system may also be a concave mirror and being tilted to an off-axis position, although these references do not teach such features explicitly however since concave mirror is a common type of optical system, which can be implicitly included in the "optical system" of Leith for making holographic phase plate to correct the aberration of the concave mirror. The

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specification also fails to teach the criticality of having this particular arrangement would overcome any problem in prior art such features are therefore being considered as obvious matter of design choices to one skilled in the art for the benefit of making holographic phase plate to correct the aberration of the concave mirror.

With regard to the features concerning the sizes of the systems, these references do not teach such features explicitly however they are either inherently met by the arrangements of the cited references or an obvious modifications to one skilled in the art since a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

With regard to the features concerning the pinhole plates used being an array of pinholes, these references do not teach such features explicitly however such modifications would have been an obvious matter of design choice to one having ordinary skill in the art since it is known in the art to use a pinhole plate or a pinhole array to provide spatial filtering to the light beam for the purpose of regulate the light beam profile and for the benefit of providing a larger corrected viewing field for the optical system.

With regard to claim 36, the feature recited is rejected under 35 USC 112, first paragraph, for the reasons stated above. It cannot be further addressed here since the feature is not enabled by the disclosure.

Response to Arguments

7. Applicant's arguments with respect to claims 1-8, 12-26, and 29-39 have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments have been addressed in the paragraphs above.

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Response to Amendment

9. The declaration under 37 CFR 1.132 filed December 16, 2002 is sufficient to overcome the rejection of claims based upon 35 USC 112, first paragraph, set forth in the previous Office Action dated September 9, 2002, concerning the operational principle of the invention.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 703-305-6208. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on 703-308-1637. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

A. Chang, Ph.D.
March 4, 2003

*Audrey Y. Chang
Primary Examiner
Art Unit 2872*